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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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HEWLETT-PACKARD COMPANY
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EXAMINER

YANCHUS III, PAUL B

ART UNIT	PAPER NUMBER
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2116

DATE MAILED: 11/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/938,210

Applicant(s)

RADJASSAMY, RAJAKRISHNAN

Examiner

Paul B Yanchus

Art Unit

2116

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17-32 is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☒ Claim(s) 3-16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/16/02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Rogers, US Patent no. 5,548,620.

Rogers discloses a method of transferring data from circuitry disposed in a lower frequency clock domain to circuitry disposed in a higher frequency clock domain, said lower frequency clock domain operating with a first clock signal [SLOW in Figure 2] and said higher frequency clock domain operating with a second clock signal [FAST in Figure 2], comprising the steps:

latching said data in a latch [element 212 in Figure 2] gated by said first clock signal to generate latched data [column 4, lines 52-56];

providing said latched data to a first register [element 222 in Figure 2] in said higher frequency clock domain to generate registered data, said first register operating responsive to a modified clock signal [FAST_R in Figure 2] synthesized at least in part from said second clock signal [column 4, lines 35-43 and Figure 3]; and

providing said registered data to a second register [element 224 in Figure 2] in said higher frequency clock domain to generate a synchronized data output [DATA OUT in Figure 2], said second register operating responsive to said second clock signal [column 5, lines 8-18].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rogers, US Patent no. 5,548,620, in view of, Rozario et al., US Patent no. 6,345,328 [Rozario].

Rogers discloses a method of transferring data from a first, slower clock domain to a second, faster clock domain, but does not specifically state that the first and second clock signals are provided at a ratio of [M:N], where N equals the number of cycles of said second clock signal and M equals the number of cycles of said first clock signal and further equals (N-1). However, Rozario discloses that it is well known in the art to transfer data from a conventional peripheral clock frequency domain [PCLK at 66MHz] to a conventional core clock frequency domain [CCLK at 133 MHz, column 5, lines 35-51 and column 6, lines 16-18]. The ratio between the conventional PCLK and CCLK domains is [1:2].

Allowable Subject Matter

Claims 3-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 17-32 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 17-23, the prior art of record does not explicitly teach a method for transferring data across a clock domain boundary comprising latching data provided by circuitry disposed in a first frequency domain to generate latched data, providing the latched data to a first register clocked by a modified clock signal that is synthesized based on a second clock signal and four intermediary clock signals derived from the second clock signal and providing the data in the first register to a second register clocked by the second clock signal.

Regarding claims 24-32, the prior art of record does not teach a system for transferring data from circuitry operating with a first clock signal in a first clock domain to circuitry operating with a second clock signal in a second clock domain, the system comprising a latch, which is gated by the first clock signal, a first register, which is clocked by a modified clock signal that is based on the second clock signal and a plurality of intermediary clock signals derived from the second clock signal and a second register which is clocked by the second clock signal. The latch provides data to the first register and the first register provides data to the second register.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Flood et al., US Patent no. 6,163,545, discloses transferring data between clock domains with frequencies that are within an integer ratio.

Lovelace et al, US Patent no. 5,930,311, discloses transferring data from a first clock domain to a second clock domain.

Nguyen, US Patent no. 5,905,766, discloses transferring data from a write clock domain to a read clock domain using registers that are clocked using modified versions of the write and read clocks.


Matsumoto, US Patent no. 5,369,672, discloses transferring data from an external clock domain to an internal clock domain.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul B Yanchus whose telephone number is (571) 272-3678. The examiner can normally be reached on Mon-Thurs 8:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne H Browne can be reached on (571) 272-3670. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Paul Yanchus
November 10, 2004



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